REMARKS

Claims 1-29 were pending. All stand rejected. The Applicants have cancelled claims 3, 8, 18 and 25. In addition, the Applicants have amended claims 1, 4, 6, 9, 11-15, 17, 23-24 and 27 and added new claims 30-61. Accordingly, claims 1-2, 4-7, 9-17, 19-24 and 26-61 are currently pending. The Applicants respectfully request further examination and reconsideration in view of the amendments made above and remarks set forth below.

Objections to the Written Disclosure:

The disclosure was objected to for a number of informalities and suggestions were made for correction. The Applicants have amended the disclosure, adopting the suggested changes.

Objections to the Drawings:

Figures 1, 2, 3, 4B, 5, 6 and 7 were objected to in view of the cross-hatching for ceramic material. The Applicants submit herewith revised formal drawings in which the cross-hatching is changed to properly reflect the ceramic material.

For Figures 2 and 7, a question was raised as to whether the upper and lower sections of ceramic material (designated by reference label 22) are different materials and, thus, whether they should be designated by different reference labels. The preferred material for each section is ceramic and, thus, the Applicants believe the same reference label should be used.

The drawings are objected to under 37 CFR 1.83(a) under the reasoning that the antenna, recited in claim 29, should be shown or the feature cancelled from the claim. The Applicants respectfully submit that the antenna is shown in drawings. More particularly, the antenna is represented in Figure 3 by element 54, in Figure 4B by element 64 and in Figure 5 by element 74.

Rejections under 35 U.S.C. § 112:

[illegible] replace this quoted language with "composed." In so doing, Applicants do not intend for

the range of equivalents for the waveguide structure to be any more limited than would be the case had the claims been originally submitted as now amended.

Claims 4 and 9 are rejected under the reasoning that it is unclear if only "said housing" is formed of "ceramic (or another material)" and under the reasoning that it is unclear how the claimed ceramic housing reconciles with the integrated housing and waveguide as recited in claims 3 and 8, from which these claims depend.

The Applicants respectfully traverse the rejection. The Applicants' specification makes clear that the waveguide structure and the housing may form a single, integrated structure. See, for example, page 8, lines 1-3 which states in reference to the embodiment of Figure 3, "A gas housing 50 for the gas fill may be formed so as to be integral with a waveguide 52...." The Applicants' specification also makes clear that though integrated, the gas housing and waveguide need not be comprised of the same materials. See, for example, page 9, lines 1-14, which describes use of different materials with respect to the embodiment of Figure 3. Accordingly, the Applicants' respectfully submit that claims 4 and 9 are sufficiently clear.

With respect to claim 14, it was noted that "said other ceramic material" lacks strict antecedent basis. The Applicant submits that sufficient antecedent basis is present by the recitation in Claim 9 of "another ceramic material" to which "said other ceramic material" clearly refers. As noted in the Manual of Patent Examining Procedure, Section 2173.05(e), "failure to provide explicit antecedent basis for terms does not always render a claim indefinite. If the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite."

Claims 2, 3, 9, 11-14, 15, 16, 23, 24 and 27 were found objectionable for various reasons and suggestions were provided for correction. The Applicants have amended the claims, adopting the suggested changes. The Applicants do not thereby intend to limit the scope of those claims.

In addition, the Applicants' have amended claims 15 and 24 to replace "transparent" with "transmissive" to broaden their scope. This [illegible]

Rejections under 35 U.S.C. § 102(b):

Claims 1, 2, 6, 7, 15, 17, 23 and 24 were rejected in view of Mucklejohn, et al.

The Applicants' overcome the rejection by the above-amendments. More particularly, claim 1 is amended to incorporate the limitations of claim 3 in which the housing and waveguide structure provide a single, integrated structure. The Applicants' submit that the limitations of claim 3 are not disclosed or suggested by Mucklejohn, et al. Accordingly, claim 1 is allowable over Mucklejohn, et al. Claim 2 is allowable over Mucklejohn, et al. at least because it is dependent from claim 1.

Claim 6 is amended to incorporate the limitations of claim 8 in which the housing and waveguide structure provide a single, integrated structure. The Applicants' submit that the limitations of claim 8 are not disclosed or suggested by Mucklejohn, et al. Accordingly, claim 6 is allowable over Muckeljohn, et al.. Claim 7 is allowable at least because it is dependent from claim 6.

Claim 15 is amended to incorporate the limitations of claim 18 in which the housing and waveguide structure provide a single, integrated structure. The Applicants' submit that the limitations of claim 18 are not disclosed or suggested by Mucklejohn, et al. Accordingly, claim 15 is allowable. Claims 17 and 23 are allowable at least because they are dependent from claim 15. Further, Claim 17 has been amended to recite that said housing is positioned at an end of said waveguide structure opposite that of the source of radio wave radiation. This amendment is supported by the Applicant's specification at least at page 8, lines 7-14.

Claim 24 is amended to incorporate the limitations of claim 25 in which the transmissive window comprises sapphire. The Applicants' submit that the limitations of claim 25 are not disclosed or suggested by Mucklejohn, et al. Accordingly, claim 24 is allowable over Mucklejohn, et al.

Rejections under 35 U.S.C. § 102(e):

Claims 24 and 26 were rejected in view of [illegible]

[illegible] transmissive window comprises sapphire. The Applicants' submit that the limitations of

claim 25 are not disclosed or suggested by MacLennen, et al.('936). Accordingly, claim 24 is allowable of MacLennan, et al. ('936). Claim 26 is allowable at least because it is dependent from claim 24.

Claims 1, 3, 4, 6-9, 15, 18, 24 and 27-29 were rejected in view of MacLennan et al. ('443).

The Applicants overcome the rejection by the above-amendments. More particularly, Claim 1 is amended to recite that the housing retains the plasma-discharge forming medium without a light-transmissive bulb envelope. As explained in the Applicants' specification at page 4, line 14, the invention permits the quartz bulb to be done away with entirely. As is also explained in the Applicants' specification at page 5, lines 19-30, this can be accomplished through use of the gas housing and window that seals the chamber to contain the gas. In contrast, MacLennan et al. ('433) discloses retaining the gas by use of a sealed bulb envelope. See col. 3, lines 49-51, of MacLennan et al. ('433) which discusses heating a pinched portion *to seal off* the bulb 5 enclosing the fill material and starting gas (emphasis added). Accordingly, the Applicants' submit that claim 1 is allowable over MacLennan et al. ('433). Claims 3 and 4 are allowable at least because they depend from claim 1.

Claim 6 is amended to recite that the housing and source of radio wave radiation are positioned substantially opposite ends of the waveguide structure. As explained in the Applicant's specification at page 8, lines 7-14, the RF source 54 may be disposed near one end of the waveguide, while the gas housing 50 may be located near the other end of the waveguide. In contrast, MacLennan, et al. ('433) explain that the excitation coil 621 is disposed *around* the container 610 in which the gas is located (emphasis added). Accordingly, the Applicants' submit that claim 6 is allowable over MacLennan, et al. ('433). Claims 7-9 are allowable at least because they depend from claim 1.

Claim 15 is amended to incorporate the limitations of claim 17. More particularly, claim 15 is amended to recite that the waveguide structure is a resonant structure which supports at least

it depends from claim 15.

As explained above, claim 24 is amended to incorporate the limitations of claim 25 in which the transmissive window comprises sapphire. The Applicants' submit that the limitations of claim 25 are not disclosed or suggested by MacLennan, et al. ('433). Accordingly, claim 24 is allowable over MacLennan, et al. ('433). Claims 27-29 are allowable at least because they depend from claim 24.

New Claims:

The Applicants have added new claims 30-61.

New claim 30 is dependent from claim 24 and, thus, is allowable at least because claim 24 is allowable, as explained above. New claim 30 recites segments of ferrite adjacent to the electrical coils. This limitation is supported by the description at least at page 7, lines 27-30 and Figure 7.

New claim 31 is dependent from claim 24 and, thus, is allowable at least because claim 24 is allowable, as explained above. New claim 31 recites that the window is tapered and conical. This limitation is supported by the description at least at page 6, line 15.

New claim 32 is an independent claim which recites a transmissive window that comprises sapphire. As explained above, neither Mucklejohn, et al., nor MacLennan, et al. ('936) and ('433) suggest or disclose such a feature. Accordingly, new claim 32 is allowable.

New claims 33-39 are dependent from new claim 32 and, thus, are allowable at least because new claim 32 is allowable, as explained above. Further, new claims 33-39 recite various limitations found in the original claims, all of which are supported by the description. Accordingly, new claims 33-39 are supported by the written description.

New claim 40 is an independent claim which recites that the housing has a window sealed to the housing for containing the plasma-discharge medium. Neither Mucklejohn, et al., nor MacLennan, et al. ('936) and ('433) appear to disclose such a feature. Accordingly, new claims 40 [illegible]

New claims 41-46 depend from new claim 40 and, thus, are allowable at least because new claim 40 is allowable. Further, new claims 41-44 recite various limitations found in the original claims, all of which are supported by the description. New claim 45 recites ferrite segments which limitation, as explained above, is supported by the written description at least at page 7, lines 27-30 and Figure 7. New claim 46 recites that the window is tapered and conical. This limitation is supported by the description at least at page 6, line 15. Accordingly, claims 45-46 are also supported by the written description.

New claims 47-52 are allowable at least because they depend from claim 1. Further, new claims 47-48 recite limitations found in the original claims, all of which are supported by the description. New claim 49 recites that the window is tapered and conical which limitation, as explained above, is supported by the written description at least at page 6, line 15. New claim 50 recites that the waveguide structure has a cross-section of varying dimension for matching impedence of the waveguide to that of the housing. This limitation is supported by the written description at least at page 10, lines 1-5 and Figure 5. New claim 51 recites that alumina is deposited along an inner boundary of the housing. This limitation is supported by the written description at least at page 9, lines 11-14. New claim 52 recites that the interior of the housing is coated with a film of MgO. This limitation is supported by the written description at least at page 10, lines 16-23.

New claim 53 is allowable at least because it depends from claim 6. New claim 53 recites that the waveguide structure has a cross-section of varying dimension for matching impedence of the waveguide to that of the housing. This limitation is supported by the written description at least at page 10, lines 1-5 and Figure 5.

New claim 54 is an independent claim which recites that the waveguide structure is a resonant structure which supports at least one resonant mode of said radio wave radiation, said waveguide structure being composed of solid dielectric material, and a housing for said plasma discharge-forming medium wherein said housing is substantially enclosed by said waveguide structure. Neither [illegible]

[illegible] the limitation that the housing is substantially enclosed by the waveguide structure is supported by the

Applicants' specification at least at by Figures 3, where it is shown that the housing is enclosed by the waveguide structure except for a window that allows light to escape the housing.

New claims 55-61 depend from new claim 54 and, thus, are allowable at least because new claim 54 is allowable. Further, new claim 55 recites a bulb envelope. New claim 56 recites that the bulb is comprised of quartz. New claim 57 recites that the bulb is comprised of sapphire. These limitations are supported by the specification at least at page 10, lines 24-26 and at page 11, lines 28-29. New claims 57-61 recite various limitations found in the original claims, all of which are supported by the description.

In view of the above, the Applicants' respectfully submit that all of the pending claims are now allowable. Allowance at an early date would be greatly appreciated. Should any issues remain, the examiner is encouraged to telephone the undersigned at (408) 293-9090 to discuss the same so that any outstanding issues may be expeditiously resolved.

Law Offices of Derek J. Westberg

Dated: Dec. 13, 2002

Derek J. Westberg (Reg. No. 40,872)

Atty. Dkt. No. 2102330-991110

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Guthrie, et al.		
Serial No.	09/818,092	Group Art Unit:	2817
Filed:	March 26, 2001	Examiner:	B. Lee
Title:	IMPROVED HIGH INTENSITY LIGHT SOURCE		

Certificate of Mailing under 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as FIRST CLASS MAIL in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on:

Date: 12-13-02 Signature: [signature]

Name of person signing certificate: Derek T. Westberg

* * *

AMENDMENTS SHOWING CHANGES TO ACCOMPANY RESPONSE TO OFFICE ACTION MAILED JUNE 17, 2002

Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action Mailed June 17, 2002, please amend the application as follows:

In the Written Description:

Please replace the paragraph on page 6, lines 13-24 with the following:

The sapphire window 34 may function as a "light integrator" for transmitting the light of the plasma lamp from the chamber, for example, to application-specific optics

with a material such as glass containing MgO, or alternatively, with [SiO, or SiO_2] SiO, or SiO. Next the mating surfaces of both the window and the ceramic channel may each be

coated with a thin layer of metallic material, such as copper, a copper alloy, or platinum. Then a piece of preferably pure platinum wire may be placed between the two thin film layers. Finally, a laser is used to heat the wire, and thereby melt the metallic material and bond the layers together.

Please replace the paragraph on page 7, lines 9-26 with the following:

Figure 2 shows a second embodiment of a lamp in accordance with the invention which is somewhat similar to Figure 1 except that the gas housing has an integrated RF energy structure. In Figure 2, the elements are designated similarly to Figure 1, using like reference numerals for like elements. The gas fill chamber 24 may be housed in a gas housing 20 preferably comprising a ceramic material 22 and provided with a light transmissive window 34, preferably of a tapered rod of sapphire as previously described and a fill plug 38[as previously described]. In this embodiment, an RF energy structure such as one or more coils 36 may be formed within the ceramic housing. The coils 36 function to inductively couple radio wave radiation energy to the gas fill in chamber 24 in order to create the plasma discharge. In this way, the RF structure of the plasma lamp that is active with radio wave energy is integral with the ceramic housing 20 that contains the plasma gas fill. This integration of the RF structure of the plasma lamp and the gas housing into a single structure, as shown, improves the coupling of RF energy to the gas, and allows significant gains in lamp efficiency and compactness.

Please replace the paragraph on page 7, lines 27-30 with the following:

The second embodiment may also comprise segments of ferrite material 41 placed adjacent the coils 36 in order to help concentrate the magnetic field associated with the coils 36 on the gas fill. An illustration of this embodiment is shown in Figure 7, in which like reference numerals are used for like elements of Figure 2

Please replace the paragraph on page 9, lines 15-23 with the following:

Figures 4A and 4B show a fourth embodiment of a light source in accordance with the invention. A gas housing 60 (see Fig. 4B) for the gas fill is formed so as to be integral with a cylindrical resonant waveguide structure 62 comprising ceramic material. Because a separate bulb is not used, the gas housing 60 and waveguide 62 comprise a single, integrated structure. A source of radio wave radiation 64 (see Fig. 4B) may be disposed near one end of the waveguide, while the gas housing is formed at an opposite end. The gas housing 60 may include a window 66 preferably made from sapphire.

In the Claims:

1. (Amended) A plasma lamp comprising:

a source of radio wave radiation;

a waveguide structure for coupling said radio wave radiation to a plasma discharge-forming medium so as to excite a plasma discharge, said waveguide structure being [at least largely] composed of solid dielectric material; and

a housing for retaining said plasma discharge-forming medium without a light-transmissive bulb envelope and wherein said housing and said waveguide structure provide a single, integrated structure.

2. (Unchanged) A plasma lamp as recited in Claim 1, wherein said waveguide structure is a resonant structure which supports at least one resonant mode of said radio wave radiation.

3. (Cancelled)

4. (Amended) A plasma lamp as recited in Claim [3] 1, wherein said housing is [formed from] comprised of ceramic material.

5. (Unchanged) A plasma lamp as recited in Claim 4, wherein said ceramic material includes alumina.

6. (Amended) A plasma lamp comprising:

a source of radio wave radiation;

a waveguide structure for coupling said radio wave radiation to a plasma

a housing for said plasma discharge-forming medium wherein said housing and said source of radio wave radiation are positioned at substantially

opposite ends of said waveguide structure and wherein said housing and said waveguide structure provide a single, integrated structure.

7. (Unchanged) A plasma lamp as recited in Claim 6, wherein said waveguide structure is a resonant structure which supports at least one resonant mode of said radio wave radiation.

8. (Cancelled)

9. (Amended) A plasma lamp as recited in Claim [8] 6, wherein said housing is [formed from] comprised of another ceramic material.

10. (Unchanged) A plasma lamp as recited in Claim 9, wherein said other ceramic material includes alumina.

11. (Amended) A plasma lamp as recited in Claim 6, wherein said [first-mentioned] ceramic material includes alumina.

12. (Amended) A plasma lamp as recited in Claim 6, wherein said [first-mentioned] ceramic material includes titanium dioxide.

13. (Amended) A plasma lamp as recited in Claim 6, wherein said [first-mentioned] ceramic material includes barium neodymium titinate.

14. (Amended) A plasma lamp as recited in Claim 9, wherein said other ceramic material is the same material as said [first-mentioned] ceramic material.

a waveguide structure for coupling said radio wave radiation to a plasma discharge-forming medium so as to excite a plasma discharge wherein said

waveguide structure is a resonant structure which supports at least one resonant mode of said radio wave radiation;

a housing for said plasma discharge-forming medium; and

wherein said waveguide structure is [at least largely] composed of a first ceramic material and said housing is formed from a second ceramic material and includes a window that is [transparent to] transmissive of visible light wherein said housing and said waveguide structure are integrated into a single structure.

16. (Unchanged) A plasma lamp as recited in claim 15, wherein said window is formed from sapphire.

17. (Amended) A plasma lamp as recited in Claim 15, wherein said housing is positioned at an end of said waveguide structure opposite that of the source of radio wave radiation [is a resonant structure which supports at least one resonant mode of said radio wave radiation].

18. (Cancelled)

19. (Unchanged) A plasma lamp as recited in Claim 15, wherein said second ceramic material includes alumina.

20. (Unchanged) A plasma lamp as recited in Claim 15, wherein said first ceramic material includes alumina.

21. (Unchanged) A plasma lamp as recited in Claim 15, wherein said first ceramic material includes titanium dioxide.

23. (Amended) A plasma lamp as recited in Claim 15, wherein said second ceramic material is the same material as said first ceramic material.

24. (Amended) A plasma lamp comprising:

a housing containing a plasma discharge-forming medium, said housing being [formed] of ceramic material and including a window that is [transparent to] transmissive of visible light produced by said plasma discharge wherein said window comprises sapphire[.];

a source of electromagnetic energy; and

means for coupling said electromagnetic energy to the plasma discharge-forming medium so as to excite a plasma discharge.

25. (Cancelled)

26. (Unchanged) A plasma lamp as recited in Claim 24, wherein said ceramic material comprises alumina.

27. (Amended) A plasma lamp as recited in Claim 24, wherein the source of electromagnetic energy and the housing are [formed] within the ceramic material as an integrated structure.

28. (Unchanged) A plasma lamp as recited in Claim 27, wherein said source of electromagnetic energy comprises electrical coils.

29. (Unchanged) A plasma lamp as recited in Claim 27, wherein said source of electromagnetic energy comprises an antenna.

31. (New) A plasma lamp as recited in Claim 24, wherein said window is tapered and conical.

32. (New) A plasma lamp comprising:

a source of radio wave radiation;

a waveguide structure for coupling said radio wave radiation to a plasma discharge-forming medium so as to excite a plasma discharge;

a housing for said plasma discharge-forming medium; and

wherein said waveguide structure is composed of a first ceramic material and said housing is formed from a second ceramic material and includes a window that is transmissive of visible light wherein said window comprises sapphire.

33. (New) A plasma lamp as recited in Claim 32, wherein said waveguide structure is a resonant structure which supports at least one resonant mode of said radio wave radiation.

34. (New) A plasma lamp as recited in Claim 32, wherein said housing and said waveguide structure are integrated into a single structure.

35. (New) A plasma lamp as recited in Claim 32, wherein said second ceramic material includes alumina.

36. (New) A plasma lamp as recited in Claim 32, wherein said first ceramic material includes alumina.

37. (New) A plasma lamp as recited in Claim 32, wherein said first ceramic

38. (New) A plasma lamp as recited in Claim 32, wherein said first ceramic material includes barium neodymium titinate.

39. (New) A plasma lamp as recited in Claim 32, wherein said second ceramic material is the same material as said first ceramic material.

40. (New) A plasma lamp comprising:

a housing having a window sealed to said housing for containing a plasma discharge-forming medium, said housing being of ceramic material and said window being transmissive of visible light produced by said plasma discharge;

a source of electromagnetic energy wherein the source of electromagnetic energy and the housing are within the ceramic material as an integrated structure; and

means for coupling said electromagnetic energy to the plasma discharge-forming medium so as to excite a plasma discharge.

41. (New) A plasma lamp as recited in Claim 40, wherein said window comprises sapphire.

42. (New) A plasma lamp as recited in Claim 40, wherein said ceramic material comprises alumina.

43. (New) A plasma lamp as recited in Claim 40, wherein said source of electromagnetic energy comprises electrical coils.

44. (New) A plasma lamp as recited in Claim 40, wherein said source of electromagnetic energy comprises an antenna.

45. (New) A plasma lamp as recited in Claim 43, further comprising segments of

[illegible]

[illegible] (New) A plasma lamp as recited in Claim 40, wherein said window is tapered and conical.

47. (New) A plasma lamp as recited in Claim 1, wherein said housing includes a window that is transmissive of visible light.

48. (New) A plasma lamp as recited in Claim 47, wherein said window is sapphire.

49. (New) A plasma lamp as recited in Claim 47, wherein said window is tapered and conical.

50. (New) A plasma lamp as recited in Claim 1, wherein said waveguide structure has a cross-section of varying dimension for matching impedence of the waveguide to that of the housing.

51. (New) A plasma lamp as recited in Claim 1, further comprising alumina deposited along an inner boundary of the housing.

52. (New) A plasma lamp as recited in Claim 1, wherein an interior of the housing is coated with a film of MgO.

53. (New) A plasma lamp as recited in Claim 6, wherein said waveguide structure has a cross-section of varying dimension for matching impedence of the waveguide to that of the housing.

54. (New) A plasma lamp comprising:

a source of radio wave radiation;

a waveguide structure for coupling said radio wave radiation to a plasma mode of said radio wave radiation and said waveguide structure being composed of solid dielectric material; and

a housing for said plasma discharge-forming medium wherein said housing is substantially enclosed by said waveguide structure.

55. (New) A plasma lamp as recited in Claim 54, further comprising a bulb envelope for retaining the plasma discharge-forming medium.

56. (New) A plasma lamp as recited in Claim 55, wherein said bulb is comprised of quartz.

57. (New) A plasma lamp as recited in Claim 55, wherein said bulb is comprised of sapphire.

58. (New) A plasma lamp as recited in Claim 54, wherein said gas housing is comprised of ceramic.

59. (New) A plasma lamp as recited in Claim 58, wherein said ceramic includes alumina.

60. (New) A plasma lamp as recited in Claim 58, wherein said waveguide structure is composed of ceramic including titanium dioxide.

61. (New) A plasma lamp as recited in Claim 58, wherein said waveguide structure is composes of ceramic including barium neodymium titinate.

Law Offices of Derek J. Westberg

Dated: Dec. 13, 2002